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The Economy and Environment Program for Southeast Asia (EEPSEA) was established in May 1993 to support training and research in environmental and resource economics across its 9 member countries: Cambodia, China, Indonesia, Laos, Malaysia, Papua New Guinea, the Philippines, Thailand, and Viet Nam. Its goal is to strengthen local capacity for the economic analysis of environmental problems so that researchers can provide sound advice to policymakers.

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Valuing A Life: An Assessment From Metro Manila

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Many environmental policies and programmes help save people's lives. However, it can be difficult to assign this key benefit a value. Because of this, mortality reduction is often not taken into account when potential projects are assessed. This omission can result in projects being undervalued and cancelled. →

A summary of EEPSEA research report 2007-RR4, 'The Value Of Mortality Risk Reduction For Children In Metro Manila, Inferred From Parents' Willingness To Pay For Dengue Vaccines' by Rosalina Palanca-Tan; c/o: Department of Economics, Ateneo de Manila University, Loyola Heights, Quezon City 1108, Philippines. Email: rtan@ateneo.edu

"The valuation will be particularly ...

➡ To try and help fill this crucial information gap, a new EEPSEA study from the Philippines has calculated a 'value of life' estimate for children in Metro Manila of between US\$0.70 million and US\$0.80 million.

The study was carried out by Rosalina Palanca-Tan, from the Department of Economics at the Ateneo de Manila University in Quezon City. Her assessment is based on parents' willingness to pay for a hypothetical dengue vaccine for their children. It takes an innovative approach to the valuation challenge and aims to remove much of the uncertainty surrounding similar past studies.

How to Estimate the Value of a Life

Many estimates of the value of a life are based on the assessment of a particular mortality risk, and the value that people place on avoiding it. Assessing such scenarios is complicated as it is often difficult to disentangle people's willingness to pay for a reduction in mortality risk from their willingness to pay for other related benefits (such as reducing the pain associated with illness). It is also often difficult to transfer results because one risk situation cannot easily be compared with another. To try and overcome these problems, Palanca-Tan took an approach that isolated people's willingness to pay (WTP) for a reduction in mortality risk.

The first step in this assessment was to ask people how much they would be willing to pay

Mean WTP for a dengue vaccine for children aged 14 years and below

	1-year efficacy vaccine	10-year efficacy vaccine
Parametric		
US\$ (PhP)	34.57 (1,729)	40.95 (2,047)
Non-parametric (lower-bound estimates)		
US\$ (PhP)	30.4 (1,520)	37.0 (1,852)

for two hypothetical dengue vaccines for their children (one vaccine would confer one year's protection from the disease, the other would give ten years' protection). This was done by asking survey respondents whether they would be willing to pay a variety of set amounts for the two vaccines.

The Metro Manila Survey

Dengue vaccines were chosen for this assessment as they offer a familiar scenario for people in the Philippines. In the last two decades, dengue outbreaks in the country have affected people across all income classes. There are therefore high levels of awareness of the risk of death from dengue. Vaccination is also widely accepted in the country as an effective means of preventing diseases in children, and news about positive developments in dengue vaccine research has appeared in Philippine newspapers since 2005.

All the necessary data was gathered through a series of surveys, all conducted in Metropolitan Manila (MM). This area consists of 14 cities and three municipalities. Respondents for the survey were drawn from MM's five largest cities, namely, Quezon

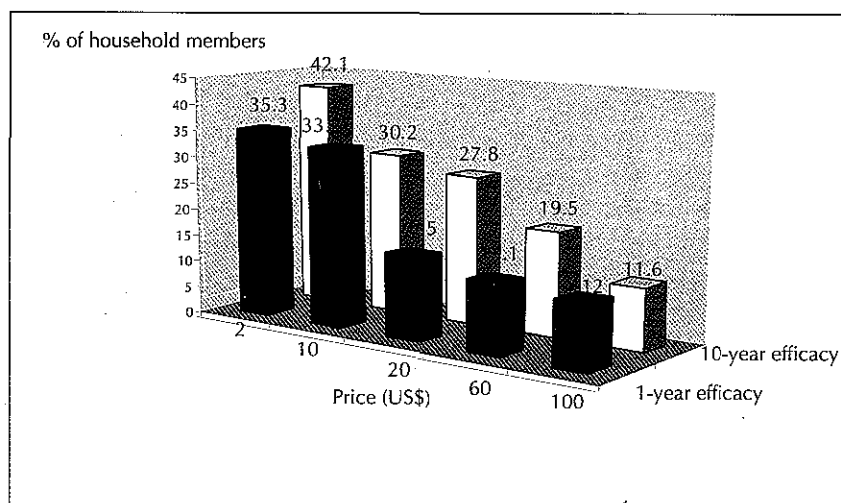
City (accounting for 21% of MM's population), Manila (15%), Caloocan (11%), Makati (5%), and Pasig (5%). For each city, a residential barangay that contained people from all social classes was randomly selected and a sample of 100 respondents was taken from each. The survey was conducted through in-person interviews during the months of February to May 2007.

Isolating WTP for Preventing Death

Once information on an overall WTP for the two vaccines had been gathered, Palanca-Tan then looked in more detail at why people would buy the vaccines. Five main reasons were isolated: (1) to prevent death; (2) to avoid the pain and suffering from being ill with dengue; (3) to avoid incurring medical expenses; (4) to avoid inconvenience and absenteeism from work or school, and; (5) to avoid having to undertake and spend for other precautionary measures. Respondents were asked to state what level of importance they placed on these five reasons.

This question was posed in an innovative 'game-like' manner (this also served to break the monotony of each question-and-

useful to environmental policy makers."



Vaccine demand

answer session). First respondents were given ten tokens and five containers. Each container was labeled with one of the reasons for buying the vaccine. The respondents were then asked to think of the tokens as representing their WTP for a vaccine. They then had to show how much they valued each 'reason' by dividing their token appropriately between the various containers. These detailed findings were then used to 'untangle' the value that people placed on the vaccines' impact on child mortality. Once this was assessed, it was then possible to calculate the 'value of life' for a child.

Background Briefings and Information

To make sure that respondents understood what they were being asked to do, they were provided with a range of background information. This included the risk of dying from dengue faced by the 14 years and below age

group (1/100,000) and by the 15 years and above age group (1/1,000,000).

To get a full picture of people's potential behaviour regarding the two vaccines, information was gathered on how they would save money or cut down on expenses to free resources to buy the vaccines. In addition an assessment was carried out on respondents' awareness of dengue and on the preventive measures that households took to combat the disease. Further socio-economic and health information was also collected.

Overall Palanca-Tan aimed to produce a result that could be applied to a wide range of scenarios and help with the valuation of a wide range of projects. Her study is one of the first to attempt this. It also differs from many past studies because it looks at people's WTP to protect each and every child in a household. This is important as eliciting a WTP for the protection of a particular household member

(e.g. a youngest child) can result in biased estimates.

Knowledge of Dengue and Vaccination

Dengue has caused more deaths in Quezon City than in the other four cities. In 2000, for instance, there were 38 reported deaths from dengue in Quezon City. This was equivalent to a mortality rate of 1.8 per 100,000. The mortality rates from dengue in the same year for the other four sampled cities were as follows: 1.3 for Caloocan, 1.1 for Pasig, 1.0 for Makati and 0.8 for Manila.

The majority of the respondents personally knew someone who had been ill with dengue, and there was a relatively high (though not perfect) knowledge about the disease. Alarmingly, about half of respondents wrongly thought that the dengue mosquito lays and breeds its eggs only in dirty water. There was also some degree of misconception about the treatment of dengue victims.

Almost all households were doing something to guard against dengue. Most were undertaking the relatively easy tasks of regularly cleaning and covering water containers. The majority of the respondents also limited the amount of time their children played out doors during the rainy season. Only about half undertook the more difficult tasks of cleaning roof gutters and the more costly precaution of using insect repellent lotion. However, while 56% of households were using mosquito-killing chemicals,

only 13% were using bed nets.

The survey results also highlighted a widespread acceptance of vaccination and the general availability of public vaccination programs in the Philippines. Almost all respondents had children in their households who had been given the basic vaccines provided under the government's Expanded Program on Immunization.

WTP Results

Two hundred and seventy-one respondents said that they would be willing to buy one or more vaccines for their household members. The price of the vaccine had a significant effect on respondents' decisions to buy — as the price went up so they became more reluctant to make a purchase.

The probability of someone buying a vaccine was significantly higher if the vaccine was for younger family members and for family members who were the respondent's own children. This could indicate that people factored the higher mortality risk of the younger children into their WTP decisions. When asked what

cutbacks they would make to buy the vaccines, the biggest proportion of respondents said they would use up savings first. Then they would economise on clothing and recreation activities.

The Value of Life

The willingness to pay for a dengue vaccine for children 14 years and below was calculated to be about US\$35 (PhP1,729) for the one-year duration vaccine and US\$41 (PhP2,047) for the ten-year duration vaccine. When these WTP results were broken down it was clear that mortality risk reduction was considered to be the most important of the five reasons for buying the dengue vaccine. On average, respondents gave the mortality risk reduction effect of the vaccines a weight of 38.7%. This finding is key, as it calls into question the results of past research that did not disentangle mortality risk benefits in their assessments. It also highlights the importance of Palanca-Tan's approach.

When these WTP findings were used to calculate the 'value of life' estimate for children in Metro Manila the result was in the range

of US\$0.70-0.80 million. This is equivalent to about 118-133 times average annual income. This result lies within the range of estimates derived in other recent survey-based studies in the region. However they are lower than previous estimates from the US (e.g. an estimate of US\$2.6-7.7 million based on vehicle fatality rates and costs) but much higher than a recent estimate from Bangladesh of US\$30-60,000.

As children are most vulnerable to environmental degradation such as air pollution and water pollution, the valuation this study provides will be particularly useful to environmental policy makers and campaigners looking to estimate the overall benefit of their work.

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